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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,060	02/26/2002	Kyle Spring	IR-1821 (2-2833)	4378

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OSTROLENK FABER GERB & SOFFEN  
1180 AVENUE OF THE AMERICAS  
NEW YORK, NY 100368403

EXAMINER

RAO, SHRINIVAS H

ART UNIT PAPER NUMBER

2814

DATE MAILED: 04/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/083,060

Applicant(s)

SPRING ET AL.

Examiner

Steven H. Rao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 3, 4 to 10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 3, 4 to 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 04 February 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 04 February 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☒ Interview Summary (PTO-413) Paper No(s) g.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

**DETAILED ACTION**

***Priority***

Receipt is acknowledged of paper submitted under 37 CFR 1.114 claiming priority from U.S. Serial No. 10/083060 filed on Feb. 02, 26, 2002 which itself claims priority under 35 U.S.C. 119(a)-(d), from provisional application No. 60/271,550 filed on February 26, 2001 which papers have been placed of record in the file.

***Request For Continued Examination***

The request filed on 01/28/2003 ( entered on 02/04/03) for a Request For Continued Examination (RCE) under 37 CFR 1.53(d) based on parent Application No. 10/083060 is acceptable and a RCE has been established. An action on the RCE follows.

***Preliminary Amendment Status***

Acknowledgment is made of entry of preliminary amendment filed on 01/28/2003 which has been entered on Feb. 04, 2003.

Therefore claims 4 to 10 as recited in the preliminary amendment are currently pending in the application.

Claims 1 and 2 have been cancelled by the preliminary amendment.

***Election/Restrictions***

Attorney Samuel H. Weiner ( 18,510) during a telephone election requirement confirmed on April 01, 2003 that Applicants' have elected With Out traverse to prosecute only method claims in this divisional application. ( See Interview Summary)

Therefore claim 3 drawn to a method and previously withdrawn from consideration is being considered in this action.

***Drawings***

The corrected drawings filed on September 16, 2002 have been reviewed by the draftsperson.

The drawing objections under 37 CFR 1.83 ( a) previously stated ( see O/A of 6/19/2002) because of the failure to show reference numeral 25 in figure 1 is maintained and made Final.

***Specification***

The proposed amendment to section [0006] is objected to a containing new matter.

Applicants' can overcome the objection by including at the end of the proposed amendment the phrase, " before avalanche voltage is reached".

Therefore the amendment , " A process and structure which prevents punch-through without increasing channel dose or channel depth would be very desirable. " if correct may be substituted for the present amendment.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 3 to 10 are rejected under 35 U.S.C. 102 (b) as being anticipated by Hshieh et al. ( U.S. Patent No. 5,907,776, herein after Hshieh).

With respect to claim 3 , Hshieh describes a method for producing a vertical MOSFET, the method comprising :

Applying a blanket implant of a first conductivity type to a substrate of a second conductivity type (Hshieh fig. 3 , col. 4 lines 40-45. Hshieh col. 4 lines 50-51 body layer ,of N-type material in P-MOSFET), forming a gate on the substrate ( Hshieh fig. 3 # 38,42) , diffusing a channel region in the substrate proximate to the gate (Hshieh fig. 3 # 50), implanting a source region of the second conductivity type into the channel region ( Hshieh fig. 3 # 48, source P type), whereby the channel region includes a depletion implant area proximate to the gate, the depletion implant area being of the first conductivity type and having a concentration of carriers of the first conductivity type which is greater than the concentration of carriers in the first of the channel region. ( Hsieh col. 4 lines 54-67).

With respect to claim 4 Hshieh describes a method for producing a vertical MOSFET, the method comprising: selecting an active region in a major surface of a

Art Unit: 2814

semiconductor body of a first conductivity type ( Hshieh fig. 3 , col. 4 lines 40-45) ;  
implanting dopants of a second conductivity type in all of said active region ( Hshieh col.  
4 lines 50-51 body layer of N-type material in P-MOSFET); forming a plurality of spaced  
channel region of said second conductivity type in said active region ( Hshieh fig. 3 #  
50) ; and forming at least one source region of said second conductivity type in each of  
said channel regions. ( Hshieh fig. 3 # 48, source P type)

With respect to claim 5 Hshieh describes the method of claim 4 further  
comprising, forming gate structures adjacent each channel region,( Hshieh fig. 3 #  
38,42 col. 4 line 66) each gate structure comprising a gate oxide formed over said  
active region and a respective gate electrode disposed over said gate oxide. ( Hsieh  
fig.3 # 44, col. 4 line 49).

With respect to claim 6 Hshieh describes the method of forming a field oxide  
layer over said major surface of said semiconductor body and opening a window to  
expose said active region. ( Hshieh fig. 7 c , col. 6 lines 20-24).

With respect to claim 7 Hshieh describes the method wherein said dopants of  
said second conductivity type are implanted through said window in said field oxide  
layer.( Hshieh figs. 7 F, I, J)

With respect to claim 8, Hshieh describes the method of claim 4, wherein said  
dopants of said second conductivity type are comprised of boron. ( Hshieh fig. 7 J)

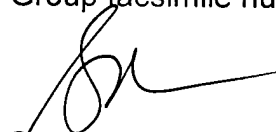
With respect to claim 9, Hshieh describes the method, wherein said dopants of  
said second conductivity type are comprised of one of arsenic and phosphorous. ( Hshieh , col. 7 line 15).

Art Unit: 2814

With respect to claim 10, Hshieh describes the method further comprising, forming depositing and oxide interlayer over said active region; opening windows over at least said source regions; and forming a source contact over said active region.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (703) 306-5945. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 5:30 p.m.

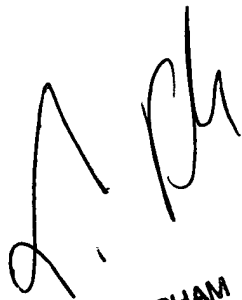
Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7724.



Steven H. Rao

Patent Examiner

April 01, 2003.



LONG PHAM  
PRIMARY EXAMINER